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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Patent Application

Applicant(s): A.D. Baker et al.
Case: 19-3
Serial No.: 09/484,098
Filing Date: January 18, 2000
Group: 2157
Examiner: Gregory G. Todd

I hereby certify that this paper is being deposited on this date with the U.S. Postal Service as first class mail addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Signature: _____ Date: March 31, 2004

Title: Methods and Apparatus for Local Network Address Acquisition, Analysis and Substitution

SUPPLEMENTAL APPEAL BRIEF

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This Supplemental Appeal Brief is submitted in response to the Office Action dated December 31, 2003 in the above-referenced application, in which the Examiner reopened prosecution in response to the Appeal Brief filed October 6, 2003.

Applicants have submitted concurrently herewith a response to the Office Action, requesting reinstatement of the appeal.

REAL PARTY IN INTEREST

The present application is currently assigned to Avaya Inc. Avaya Inc. is the real party in interest.

RELATED APPEALS AND INTERFERENCES

There are no known related appeals or interferences.

STATUS OF CLAIMS

Claims 1-21 are pending in the present application. Each of claims 1, 11 and 21 stands rejected under 35 U.S.C. §112, first paragraph. Each of claims 1-21 stands rejected under 35 U.S.C. §103(a). Claims 1-21 are appealed.

STATUS OF AMENDMENTS

There have been no amendments filed subsequent to the final rejection.

SUMMARY OF INVENTION

The present invention is directed to an apparatus, method and machine-readable storage medium for use in interfacing a local network to one or more external network elements.

An illustrative embodiment of the invention is shown in FIG. 1 of the drawings, and includes a local area network (LAN) 102 and a gateway 110. The LAN 102 is coupled to personal computers PC-1, PC-2, . . . PC-N, a printer 104 and a file server 106. The gateway 110 communicates via a DSL access multiplexer (DSLAM) 112 with external networks 114 and 116.

As indicated on page 4, lines 9-13 of the specification, a significant problem associated with a conventional gateway in a system such as that of FIG. 1 is that IP address disparity can arise between the personal computers, printer, file server or other devices attached to the LAN 102, such that direct communications between these devices are routed through one or more of the external networks 114 and 116. This is clearly undesirable in that it unnecessarily consumes network and gateway processing resources.

The present invention solves this significant problem of the prior art by implementing an address substitution mechanism in the gateway 110. Generally, the gateway is configured to determine remotely-assigned address information for a given device attached to the LAN, and to establish, based at least in part on the remotely-assigned address information, a substitution address for use by at least one other device attached to the local network when communicating with the given device.

The address substitution mechanism in the illustrative embodiment is described as follows at page 4, lines 14-23 of the specification:

In accordance with the invention, gateway 110 is configured to intercept and store all address assignments issued by a remote network address server during an IP address assignment process, e.g. during a designated IP address exchange interval. The gateway 110 will then "trap" all incoming requests during, e.g., capabilities identification exchanges, and reissue the requests after evaluating and potentially adjusting the address fields thereof to a format suitable to each of the other devices on the LAN 102. Finally, at transport service time, the gateway 110 will receive individual message requests from devices on the LAN 102, map their addresses to appropriate substitution addresses, and reissue the messages with the altered addresses.

The address substitution mechanism implemented in the gateway 110 thus advantageously ensures that communications between devices attached to the local network are not routed through an external network as a result of disparity in their remotely-assigned IP addresses.

ISSUES PRESENTED FOR REVIEW

1. Whether claims 1, 11 and 21 are properly rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the enablement requirement.

2. Whether claims 1-3, 5-13 and 15-21 are unpatentable under 35 U.S.C. §103(a) over U.S. Patent No. 6,006,272 (hereinafter "Aravamudan") in view of U.S. Patent No. 6,128,664 (hereinafter "Yanagidate").

3. Whether claims 4 and 14 are unpatentable under 35 U.S.C. §103(a) over Aravamudan in view of Yanagidate and in further view of U.S. Patent No. 6,414,952 (hereinafter "Foley").

GROUPING OF CLAIMS

With regard to Issue 1, claims 1, 11 and 21 stand or fall together.

With regard to Issue 2, claims 1-3, 9,11-13, 19 and 21 stand or fall together, claims 5 and 15 stand or fall together, claims 6 and 16 stand or fall together, claims 7 and 17 stand or fall together, claims 8 and 18 stand or fall together, and claims 10 and 20 stand or fall together.

With regard to Issue 3, claims 4 and 14 stand or fall together.

ARGUMENT

Issue 1

The Examiner argues that each of independent claims 1, 11 and 21 contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to make or to use the invention. Applicants respectfully disagree.

Independent claim 1 is directed to an apparatus for use in interfacing a local network to one or more external network elements. The apparatus includes a gateway coupled between the local network and the one or more external network elements. The gateway is operative to perform the following functions:

(i) to determine remotely-assigned address information for a given device attached to the local network; and

(ii) to establish, based at least in part on the remotely-assigned address information, a substitution address for use by at least one other device attached to the local network when communicating with the given device.

Thus, in accordance with the invention, a LAN or other type of local network is interfaced with one or more external network elements via a gateway that advantageously implements an address substitution mechanism for ensuring that communications between devices attached to the local network are not routed through an external network as a result of, e.g., disparity in their remotely-assigned IP addresses.

The gateway in an illustrative embodiment described in the specification at page 4, lines 14-23, is configured to intercept communications from devices on the local network in order to determine remotely-assigned IP address information for those devices. After such information is determined for a given device, the gateway creates a set of address substitution information that includes sub-network compatible addresses for use by other devices on the local network when communicating with the given device. The substitution addresses are then used in subsequent communications between the devices on the local network, thereby ensuring that communications between these devices are not routed through the external network.

Applicants note that the foregoing reference to an illustrative embodiment is intended merely to present a concrete example of one possible arrangement falling within the limitations of claim 1.

The Examiner argues that claim 1 is not enabled by the specification because of various teachings alleged to be present in a document identified as RFC 1597. This document is not referenced in any way in the present specification, but has been cited by the Examiner.

Applicants submit that the present specification, as described in greater detail in the Summary of Invention and elsewhere above, clearly enables the invention claimed in claim 1. It is believed that the interpretation of RFC 1597 proffered by the Examiner, to the extent it allegedly creates an enablement issue in the present specification, is fundamentally flawed. The specification stands on its own, without reference to RFC 1597, and meets the requirements of §112 with regard to the invention claimed in claim 1. The §112 rejection is therefore believed to be improper, and should be withdrawn.

Independent claims 11 and 21 are believed to be compliant with §112 for substantially the same reasons identified above with regard to independent claim 1.

Issue 2

A proper *prima facie* case of obviousness requires that the cited references when combined must "teach or suggest all the claim limitations," and that there be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to combine the references or to modify the reference teachings. See Manual of Patent Examining Procedure (MPEP), Eighth Edition, August 2001, §706.02(j).

Applicants submit that the Examiner has failed to establish a proper *prima facie* case of obviousness in the present §103(a) rejection, in that the Aravamudan and Yanagidate references, even if assumed to be combinable, fail to teach or suggest all the claim limitations, and in that no cogent motivation has been identified for combining the references or modifying the reference teachings to reach the claimed invention.

As indicated above, independent claim 1 calls for a gateway coupled between a local network and one or more external network elements, and operative to perform the following functions:

(i) to determine remotely-assigned address information for a given device attached to the local network; and

(ii) to establish, based at least in part on the remotely-assigned address information, a substitution address for use by at least one other device attached to the local network when communicating with the given device.

Thus, the claimed invention specifically requires a gateway that performs both of the above-identified operations (i) and (ii). In the illustrative embodiment mentioned previously, the gateway is configured to intercept communications from devices on the local network in order to determine remotely-assigned IP address information for those devices. After such information is determined for a given device, the gateway creates a set of address substitution information that includes sub-network compatible addresses for use by other devices on the local network when communicating with the given device. The substitution addresses are then used in subsequent communications between the devices on the local network, thereby ensuring that communications between these devices are not routed through the external network. It is therefore the gateway itself that implements an address substitution mechanism in the claimed invention.

Applicants submit that the Aravamudan and Yanagidate references, even if assumed to be combinable in the manner urged by the Examiner, fail to teach or suggest the above-noted claim limitations, and also fail to provide the associated advantages of the claimed invention. More specifically, the proposed combination of Aravamudan and Yanagidate fails to disclose a gateway that performs both of the above-identified operations (i) and (ii).

The Examiner argues that the router referred to in the flow diagram of FIG. 2 in Aravamudan corresponds to the claimed gateway. However, it is apparent from the FIG. 2 flow diagram and the relied-upon text in column 2, line 60, to column 3, line 6, and column 3, line 50, to column 4, line 33, that the Aravamudan router does not operate in the manner claimed, that is, it does not perform operations (i) and (ii) as claimed. Instead, Aravamudan at column 2, lines 60-65, explicitly discloses that "every device within a given home network is assigned three addresses," including both an intranet address and an internet address. As a result, there is absolutely no need whatsoever for the router in Aravamudan to determine remotely-assigned address information for a given device attached to the local network, and to establish a substitution address based at least in part on the

remotely-assigned address information, as required by the claimed invention. The portion of Yanagidate cited by the Examiner, namely column 5, line 38, to column 6, line 25, fails to supplement this fundamental deficiency of the Aravamudan reference. Thus, the proposed combination of Aravamudan and Yanagidate not only fails to meet the claim limitations, but in fact actively teaches away from them.

Accordingly, independent claim 1 is believed to include one or more limitations which are not taught or suggested by the proposed combination of Aravamudan and Yanagidate. The combined disclosures of these references therefore fail to "teach or suggest all the claim limitations" as would be required by a proper §103(a) rejection.

Also, as indicated previously, the Examiner has failed to identify a cogent motivation for combining the references or modifying the reference teachings to reach the claimed invention. Neither Aravamudan nor Yanagidate teaches or suggests a gateway operative to perform either operation (i) or (ii) as claimed. However, the Examiner states that it would be obvious to combine the references or to modify the teachings of the references to reach the claimed invention. In support of this argument, the Examiner at page 4, third paragraph, of the Office Action provides the following statement regarding motivation to combine or modify the references:

> [I]t would have been obvious . . . to incorporate the use of Yanagidate's address correlation into Aravamudan's system as this would further enhance Aravamudan's system to limit communication between devices on the home network to stay behind the router, gateway and forward the packets directly to the other device on the home network according to the logical address assigned to the device.

Applicants respectfully submit that this is a conclusory statement of obviousness, and insufficient to support the proposed modification of the reference teachings.

The Federal Circuit has stated that when patentability turns on the question of obviousness, the obviousness determination "must be based on objective evidence of record" and that "this precedent has been reinforced in myriad decisions, and cannot be dispensed with." In re Sang-Su Lee, 277 F.3d 1338, 1343 (Fed. Cir. 2002). Moreover, the Federal Circuit has stated that

"conclusory statements" by an examiner fail to adequately address the factual question of motivation, which is material to patentability and cannot be resolved "on subjective belief and unknown authority." Id. at 1343-1344. There has been no showing in the present §103(a) rejection of objective evidence of record that would motivate one skilled in the art to combine Aravamudan and Yanagidate, or to modify the proposed combination of Aravamudan and Yanagidate, to produce the particular limitations in question. The above-quoted statement of obviousness given by the Examiner in the Office Action is precisely the type of subjective, conclusory statement that the Federal Circuit has indicated provides insufficient support for an obviousness rejection.

In addition, Applicants note that there is no need for the Yanagidate technique in the Aravamudan system. As noted above, Aravamudan at column 2, lines 60-65, explicitly discloses that "every device within a given home network is assigned three addresses," including both an intranet address and an internet address. Thus, one skilled in the art would not be motivated to include in Aravamudan the host name to private address translation mechanism of Yanagidate, since the Aravamudan reference already provides a suitable translation mechanism via the "three addresses" assigned to every device within a given home network. The translation mechanisms of Aravamudan and Yanagidate are believed to be mutually incompatible, and this would tend to suggest that the references are not combinable in the manner proposed.

Furthermore, Applicants believe that both Aravamudan and Yanagidate teach away from the proposed combination. Since Aravamudan automatically assigns multiple addresses to each of the devices within a given home network, there is no need therein for additional address translation features of the type described in Yanagidate. The proposed combination could well result in an unworkable implementation, and at the very least results in a less efficient implementation since there would be clear duplication of address translation functionality.

Independent claims 11 and 21 are believed allowable for substantially the same reasons identified above with regard to independent claim 1.

Dependent claims 2, 3, 5-10, 12, 13 and 15-20 are believed allowable for at least the reasons identified above with regard to their respective independent claims. Moreover, at least claim pairs 5 and 15, 6 and 16, 7 and 17, 8 and 18, and 10 and 20 are believed to define additional separately-

patentable subject matter relative to the proposed combination of Aravamudan and Yanagidate, as described in greater detail below.

With regard to claims 5 and 15, each of these claims specifies that the gateway stores remotely-assigned address information for each of a plurality of devices attached to the local network. The Examiner in the Office Action at page 5, section 9, argues that these limitations are met by the teachings in column 2, line 60, to column 3, line 15, of Aravamudan. Applicants respectfully disagree. The limitations in question refer to storage of remotely-assigned address information in the gateway. In Aravamudan, the address information is communicated from a device on a home network to the router. See column 3, lines 50-63. Thus, there is no need in Aravamudan for the claimed storage of remotely-assigned address information for each of a plurality of devices attached to the local network. The proposed combination of Aravamudan and Yanagidate therefore fails to meet the limitations in question.

With regard to claims 6 and 16, each of these claims specifies that the gateway stores a set of address substitution information for each of the plurality of devices, with the set of address substitution information for a given one of the devices comprising an address to be used by the given device in communicating with the gateway and addresses to be used by the given device in communicating with each of the other devices. The Examiner in the Office Action at page 5, section 10, argues that these limitations are met by the teachings in FIG. 3 and column 4, line 62, to column 5, line 15, of Aravamudan. Applicants respectfully disagree. The cited portions of Aravamudan do not disclose storing a set of address substitution information for each of a plurality of devices attached to a local network, with the address substitution information providing separate addresses for use by the given device in communicating with the gateway and with other devices attached to the same local network. The proposed combination of Aravamudan and Yanagidate therefore fails to meet the limitations in question.

With regard to claims 7 and 17, each of these claims specifies that the stored information comprises an address substitution matrix having a row of address information for each of the plurality of devices attached to the local network. The Examiner in the Office Action at page 5, section 11, argues that the limitation in question is disclosed in FIG. 3, but does not identify whether it is FIG. 3 of Aravamudan or FIG. 3 of Yanagidate that is relied upon. However, neither figure

provides any specific disclosure that meets the particular limitation in question. It is therefore believed that the proposed combination of Aravamudan and Yanagidate fails to meet the limitations in question.

With regard to claims 8 and 18, each of these claims specifies that a given one of the sets of address substitution information for a particular one of the plurality of devices comprises a set of IP addresses, each of which is sub-network compatible with an IP address remotely assigned to the corresponding device, such that communications between the given device and another one of the devices attached to the local network are not routed through an external network element. The particular address substitution information recited in these claims is not met by the combined disclosure of Aravamudan and Yanagidate.

With regard to claims 10 and 20, each of these claims specifies that the gateway intercepts at least one of control information and maintenance information received over the local network and associated with the given device so as to perform related services on behalf of the given device. The Examiner in the Office Action at page 6, section 14, argues that these limitations are met by the teachings in FIG. 4, but again does not identify which of the two references is relied upon. The limitations in question refer to the interception of information received over the local network, and the performance of services on behalf of a device, other than the gateway, attached to the local network. The proposed combination of Aravamudan and Yanagidate fails to meet the particular limitations in question.

Issue 3

Applicants submit that claims 4 and 14 are allowable for at least the reasons identified above with regard to their respective independent claims. The arguments presented in conjunction with Issue 2 above are therefore realleged and incorporated by reference. The Foley reference fails to supplement the fundamental deficiencies of Aravamudan and Yanagidate as applied to the independent claims.

Moreover, the combined teachings of Aravamudan, Yanagidate and Foley fail to disclose a gateway device comprising an ATU-R device with the particular functionality claimed. Although Foley mentions the use of ADSL, it fails to specifically teach the incorporation of the claimed

functionality into an ATU-R device. The Examiner fails to identify any objective evidence of suggestion or motivation for the proposed combination. It therefore appears that the Examiner in rejecting claims 4 and 14 has simply undertaken a hindsight-based reconstruction of the claimed invention, with the benefit of the disclosure provided by Applicants.

In view of the foregoing, Applicants believe that claims 1-21 are in condition for allowance, and respectfully request the withdrawal of the §112 and §103(a) rejections.

Respectfully submitted,

Date: March 31, 2004

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APPENDIX

1. (Amended) An apparatus for use in interfacing a local network to one or more external network elements, the apparatus comprising:

a gateway coupled between the local network and the one or more external network elements, the gateway being operative to determine remotely-assigned address information for a given device attached to the local network; and to establish, based at least in part on the remotely-assigned address information, a substitution address for use by at least one other device attached to the local network when communicating with the given device.

2. (Amended) The apparatus of claim 1 wherein the remotely-assigned address information comprises an Internet protocol (IP) address assigned to the given device by an external network element.

3. The apparatus of claim 1 wherein the local network comprises a local area network (LAN).

4. The apparatus of claim 1 wherein the gateway comprises an ADSL (asymmetric digital subscriber loop) termination unit-receive (ATU-R) device.

5. The apparatus of claim 1 wherein the gateway stores remotely-assigned address information for each of a plurality of devices attached to the local network.

6. The apparatus of claim 5 wherein the gateway stores a set of address substitution information for each of the plurality of devices, the set of address substitution information for a given one of the devices comprising an address to be used by the given device in communicating with the gateway, and addresses to be used by the given device in communicating with each of the other devices.

7. The apparatus of claim 6 wherein the stored information comprises an address substitution matrix having a row of address information for each of the plurality of devices attached to the local network.

8. (Amended) The apparatus of claim 6 wherein a given one of the sets of address substitution information for a particular one of the plurality of devices comprises a set of IP addresses, each of which is sub-network compatible with an IP address remotely assigned to the corresponding device, such that communications between the given device and another one of the devices attached to the local network are not routed through an external network element.

9. The apparatus of claim 1 wherein the gateway processes a particular received packet in order to replace remotely-assigned address information in a header thereof with a corresponding substitution address determined by the gateway.

10. The apparatus of claim 1 wherein the gateway intercepts at least one of control information and maintenance information received over the local network and associated with the given device so as to perform related services on behalf of the given device.

11. (Amended) A method for use in interfacing a local network to one or more external network elements, the method comprising the steps of:

determining, in a gateway coupled between the local network and the one or more external network elements, remotely-assigned address information for a given device attached to the local network; and

establishing a substitution address for use by at least one other device attached to the local network when communicating with the given device, based at least in part on the remotely-assigned address information.

12. (Amended) The method of claim 11 wherein the remotely-assigned address information comprises an Internet protocol (IP) address assigned to the given device by an external network element.

13. The method of claim 11 wherein the local network comprises a local area network (LAN).

14. The method of claim 11 wherein the gateway comprises an ADSL (asymmetric digital subscriber loop) termination unit-receive (ATU-R) device.

15. The method of claim 11 wherein the gateway stores remotely-assigned address information for each of a plurality of devices attached to the local network.

16. The method of claim 15 wherein the gateway stores a set of address substitution information for each of the plurality of devices, the set of address substitution information for a given one of the devices comprising an address to be used by the given device in communicating with the gateway, and addresses to be used by the given device in communicating with each of the other devices.

17. The method of claim 16 wherein the stored information comprises an address substitution matrix having a row of address information for each of the plurality of devices attached to the local network.

18. (Amended) The method of claim 16 wherein a given one of the sets of address substitution information for a particular one of the plurality of devices comprises a set of IP addresses, each of which is sub-network compatible with an IP address remotely assigned to the corresponding device, such that communications between the given device and another one of the devices attached to the local network are not routed through an external network element.

19. The method of claim 11 wherein the gateway processes a particular received packet in order to replace remotely-assigned address information in a header thereof with a corresponding substitution address determined by the gateway.

20. The method of claim 11 wherein the gateway intercepts at least one of control information and maintenance information received over the local network and associated with the given device so as to perform related services on behalf of the given device.

21. (Amended) A machine-readable medium storing one or more programs for use in interfacing a local network to one or more external network elements, wherein the one or more programs when executed by a processor implement the steps of:

determining, in a gateway coupled between the local network and the one or more external network elements, remotely-assigned address information for a given device attached to the local network; and

establishing a substitution address for use by at least one other device attached to the local network when communicating with the given device, based at least in part on the remotely-assigned address information.